

SEQUENCE LISTING

<110> Godfroi, Edmond
Bollen, Alex
Leboullie, Gerard

<120> IDENTIFICATION AND MOLECULAR CHARACERIZATION OF
PROTEINS, EXPRESSED IN THE IXODES RICINUS SALIVARY
GLANDS

<130> VANM229.001CP1

<140>
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<150> PCT/BE00/00061
<151> 2000-06-06

<150> GB 9913425.6
<151> 1999-06-09

<160> 34

<170> FastSEQ for Windows Version 3.0

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tcgacgttagc tcctgactag aaactcgtag gctaggacag aactttctt caggtagc 180
gtaatgtcct cgtt 194

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tcgcaaatgc acttcccgtg ctgtcgcat ttcgccccaa aagcgcattgg cattccttcc 180
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ggagaaaaat gggtgcaacg gggggatcag cgtttgtact tgcaaacatt tggagacg 480
gttaaaccwgt atttcgcgaa actcagatgc tccagcgtga agctcgctt aataaaaagtt 540

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agcggaa 607

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cataagttaa accctgtcat tataagtgtg attgccgtat ctcggctgaa tgggttccat 180
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tcatcgata tcttcgccc 259

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gtaacagcaa aaacacttac agttgaaggg tgcaagtgtca gacgctatgg aagttgcac 120
cacgagcacr accctgatta ctactggcca cgttgctrtc cgggtcgtcc 170

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tcaaaaatatc cgttccctga agatgaggga attacactga taatgacagg gtttgattta 180
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gta gac aca gcc aac cac aaa ggt aga ggg cgg cct gcg aag tgt aaa 96
Val Asp Thr Ala Asn His Lys Gly Arg Gly Arg Pro Ala Lys Cys Lys
 20 25 30

ctt cct ccg gac gac gga cca tgc aga gca cga att ccg agt tac tac 144
Leu Pro Pro Asp Asp Gly Pro Cys Arg Ala Arg Ile Pro Ser Tyr Tyr
 35 40 45

ttt gat aga aaa acc aaa acg tgc aag gag ttt atg tat ggc gga tgc 192
Phe Asp Arg Lys Thr Lys Thr Cys Lys Glu Phe Met Tyr Gly Gly Cys
 50 55 60

gaa gga aac gaa aac aat ttt gaa aac ata act acg tgc caa gag gaa 240
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Cys Arg Ala Lys Lys Val
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<213> Ixodes ricinus

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 20 25 30

Leu Pro Pro Asp Asp Gly Pro Cys Arg Ala Arg Ile Pro Ser Tyr Tyr
 35 40 45

Phe Asp Arg Lys Thr Lys Thr Cys Lys Glu Phe Met Tyr Gly Gly Cys
 50 55 60

Glu Gly Asn Glu Asn Asn Phe Glu Asn Ile Thr Thr Cys Gln Glu Glu
 65 70 75 80

Cys Arg Ala Lys Lys Val
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atcttccaca gcgcgttgcg cacgcctcct ggaatagaa cgcgttctct cctccgcac 180
tccatttgaa atcatacgaaa catcttcag ttigaatatt gtagcgataa taatcggtat 240
cagtttcttt gcatggcctt gggagggtt tggcgcaggg gccgtattca gg 292

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<211> 270
<212> DNA
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atctcacgga tggatgtgtg acactttat atctcaggtt tgccgacatt gccattacag 180
ataaatagtt gataatttct ttcttggat agttgtaaagc agcgcattttt gttgcattcaa 240
gcaccacatg cacttcaggc aatatggttt 270

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<211> 316
<212> DNA
<213> Ixodes ricinus

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acgccaatag gggttctcgc aaagaacata tcatttggag gaaggcgtag tccgtcgaga 180
tatcccaaaa ctagggtttca attgcgtgcg aaccaactgc ccccacttct gtatgtgtac 240
tgtaaggagt rgttgaacgg ygtcctttt cccataacct tgaagtttc acactgcaga 300
ggattacctc tcaaaa 316

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<211> 241
<212> DNA
<213> Ixodes ricinus

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aatggctctg gtcctataa tagtcggata atgttagaaat cgctccatgt ggccaaatag 180
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ccacccagtt taaaagtgcg agaacgcaca gtggtttacc gtaacaagta caccagagg 180
cctgtaaatt ttaccgtcg agttgccatg ctgattgata agtatttata cwaggagttc 240
aagaacgaga gccacatcg accgtacctg gctatgatac tgacttgat aatctgagg 300
tatgccgaca cacatgaccc gtacatccag tttcttctca cacaagtgtt cgtggggaw 360
wctggcgatc atatggcca catgcccttc cgacgacgt tcttggtcag ggcgcggcat 420
tatgcgcagt ttaggcccattt macacccattt cacttgtaat tctccgttgc tggatagtgt 480
aagtgaggcc attgcatcgat catcggtggaa gargccttc tccaagttagg aaccgcccatt 540
tttaggtttgc tttcccaatc cgccaattta anttttaaaa aaaattcccc ccccaaaaaat 600
taatttttt taaaggtgga ttgtgatttc tccgtt 636

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<212> DNA
<213> Ixodes ricinus

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actgcctcta caaagtcaat gccaaggatg ctgtaaaaag cctaataatct ctgcccggat 180
tttaggatatc gccaacgagt ttctgtcaat ttatgcatttcc gctttaccgc ggtgtccata 240
gcgataagaa agcaggtctg tccgatttgcg tacagacgtt tagaacggcc aaaaatcgac 300
gaggaggcta ccattcatgg attcacgcgg cacttgacgg gggtccttgc gacaagagaaa 360
accccaagaa ggctgcata aacggaaat gcaccctcct taagagcatg ccccacagaaa 420
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<210> 15
<211> 466
<212> DNA
<213> Ixodes ricinus

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catcctcgat ttttaggatg actgcgcaca ttgttttgc atcgtgttgc aggtgtttgt 180
tatggccgaa gccgtcgaca taagtattga ccaacgatcg gccgaatgt tacggctcac 240
caaacacatc aaatacccccc gtcaagtcaa gagctggaaag cacaaggatc agtatgtaca 300
agataccctt gggaaatcttt cccgaagttt accttgcgtt ggacagcaca ttggccaaag 360
cttttaattt tgacgtgtac aaagtaacgc gttacttcgc agtgcttaca aatgcggcta 420
atcttaggtt tgccagcttc gtatttccaa aagtacagct caggat 466

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<212> DNA
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 gtatgttaggg tcagcgtgca tgccttcgtc gtacatatac accctctgac agtagttgt 180
 cagttgtgtc atcctaccag gaagcttaga cgaacgtttt attgttttg tcgtgtatcg 240
 ttctctaaagg catttgaatt ccggacgggtt gtagaggttc ctgacttctc gctggcagca 300
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<220>
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 Ser Gly Leu Ser Leu Lys Leu Trp Ile Val Ala Phe Phe Ser Phe Cys
 5 10 15

ttg gcc gag aaa gag cat ggg atc gtg tac ccc agg atg ctt gaa agc 152
 Leu Ala Glu Lys Glu His Gly Ile Val Tyr Pro Arg Met Leu Glu Ser
 20 25 30

aga gca gca act gga gag aga atg ctt aaa atc aac gat gac ctg acg 200
 Arg Ala Ala Thr Gly Glu Arg Met Leu Lys Ile Asn Asp Asp Leu Thr
 35 40 45

ttg acg ctg cag aag agt aag gtc ttc gct gac gac ttt ctc ttc agc 248
 Leu Thr Leu Gln Lys Ser Lys Val Phe Ala Asp Asp Phe Leu Phe Ser
 50 55 60 65

acg acc gac gga att gaa cct att gat tac tac atc aaa gcc gaa gac 296
 Thr Thr Asp Gly Ile Glu Pro Ile Asp Tyr Tyr Ile Lys Ala Glu Asp
 70 75 80

gct gaa cgt gac atc tac cac gac gca act cac atg gca tca gta agg 344
 Ala Glu Arg Asp Ile Tyr His Asp Ala Thr His Met Ala Ser Val Arg
 85 90 95

gta acg gac gat gat ggc gtg gaa gtg gaa gga att ctt gga gag agg 392
 Val Thr Asp Asp Asp Gly Val Glu Val Glu Gly Ile Leu Gly Glu Arg
 100 105 110

ctt cgt gtt aaa cct ttg ccg gca atg gcc cgc agc agc gat ggc ctc 440
 Leu Arg Val Lys Pro Leu Pro Ala Met Ala Arg Ser Ser Asp Gly Leu
 115 120 125

aga ccg cat atg ttg tac gaa gtc gac gca cac gaa aac ggc cgg cca 488
 Arg Pro His Met Leu Tyr Glu Val Asp Ala His Glu Asn Gly Arg Pro

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cat gat tat ggt tca ccg aac aca aca aat acc ccc gta gag aga aga His Asp Tyr Gly Ser Pro Asn Thr Thr Asn Thr Pro Val Glu Arg Arg				536
150		155	160	
gct gga ggc aca gaa ccc cag atg tac aag ata cca gcg gaa atc tat Ala Gly Gly Thr Glu Pro Gln Met Tyr Lys Ile Pro Ala Glu Ile Tyr				584
165	170	175		
ccc gaa gtt tac ctt gtg gcg gat agt gcc ttt gcc aaa gaa ttt aac Pro Glu Val Tyr Leu Val Ala Asp Ser Ala Phe Ala Lys Glu Phe Asn				632
180	185	190		
ttt gat gtg aac gcc gtt acg cgt tac ttc gca gtg ctt aca aat gcg Phe Asp Val Asn Ala Val Thr Arg Tyr Phe Ala Val Leu Thr Asn Ala				680
195	200	205		
gct aat ctt agg tat gaa agc ttc aaa tct cca aag gta cag ctc agg Ala Asn Leu Arg Tyr Glu Ser Phe Lys Ser Pro Lys Val Gln Leu Arg				728
210	215	220	225	
atc gtt ggc ata acg atg aac aaa aac cca gca gac gag cca tac att Ile Val Gly Ile Thr Met Asn Lys Asn Pro Ala Asp Glu Pro Tyr Ile				776
230	235	240		
cac aat ata cgg gga tat gag cag tac cgg aat att ttg ttt aag gaa His Asn Ile Arg Gly Tyr Glu Gln Tyr Arg Asn Ile Leu Phe Lys Glu				824
245	250	255		
aca ctg gag gat ttc aac act cag atg aag tca aaa cat ttt tat cgt Thr Leu Glu Asp Phe Asn Thr Gln Met Lys Ser Lys His Phe Tyr Arg				872
260	265	270		
act gcc gat atc gtg ttt ctc gtg aca gca aaa aat atg tcc gaa tgg Thr Ala Asp Ile Val Phe Leu Val Thr Ala Lys Asn Met Ser Glu Trp				920
275	280	285		
gtt ggt agc aca ctacaa tca tgg act ggc ggg tac gct tac gta gga Val Gly Ser Thr Leu Gln Ser Trp Thr Gly Gly Tyr Ala Tyr Val Gly				968
290	295	300	305	
aca gcg tgt tcc gaa tgg aaa gta gga atg tgt gaa gac cga ccg aca Thr Ala Cys Ser Glu Trp Lys Val Gly Met Cys Glu Asp Arg Pro Thr				1016
310	315	320		
agc tat tac gga gct tac gtt ttc gcc cat gag ctg gcg cat aat ttg Ser Tyr Tyr Gly Ala Tyr Val Phe Ala His Glu Leu Ala His Asn Leu				1064
325	330	335		
ggt tgt caa cac gat gga gat ggt gcc aat agc tgg gtg aaa ggg cac Gly Cys Gln His Asp Gly Asp Gly Ala Asn Ser Trp Val Lys Gly His				1112
340	345	350		
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355	360	365		

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Lys Met Glu Asp Glu Arg Gln Tyr Lys Phe Ser Pro Tyr Cys Gln Arg		
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gaa gtc agg aac ctc tac agg cgt ccg gaa ttc aaa tgc ctc act gaa		1256
Glu Val Arg Asn Leu Tyr Arg Arg Pro Glu Phe Lys Cys Leu Thr Glu		
390 395 400		
cga aaa gcg aaa aaa aca atc cgc tcg tct aag cta cct ggt gtg atg		1304
Arg Lys Ala Lys Lys Thr Ile Arg Ser Ser Lys Leu Pro Gly Val Met		
405 410 415		
aca tca tcg agc aac tat tgc cg ^g agg gtg tac atg tac gaa aaa ggc		1352
Thr Ser Ser Asn Tyr Cys Arg Arg Val Tyr Met Tyr Glu Lys Gly		
420 425 430		
atg cac gcc gac gag gca tat ggc gtc aag gac tgc agg gta aaa tgc		1400
Met His Ala Asp Glu Ala Tyr Gly Val Lys Asp Cys Arg Val Lys Cys		
435 440 445		
acc acc aca tca aga atg tat tgg cta ctc ggt gta gtc gac ggt aca		1448
Thr Thr Thr Ser Arg Met Tyr Trp Leu Leu Gly Val Val Asp Gly Thr		
450 455 460 465		
cct tgc gga aat gga aag gct tgc att ctt ggg aaa tgc agg aac aaa		1496
Pro Cys Gly Asn Gly Lys Ala Cys Ile Leu Gly Lys Cys Arg Asn Lys		
470 475 480		
atc aaa ata agc aag aag gac tgagagg ^{tt} g ataataatcaa attaata ^{cat} g		1547
Ile Lys Ile Ser Lys Lys Asp		
485		
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atg	1670	
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Ser Arg Ala Ala Thr Gly Glu Arg Met Leu Lys Ile Asn Asp Asp Leu		
35 40 45		
Thr Leu Thr Leu Gln Lys Ser Lys Val Phe Ala Asp Asp Phe Leu Phe		
50 55 60		

Ser Thr Thr Asp Gly Ile Glu Pro Ile Asp Tyr Tyr Ile Lys Ala Glu
 65 70 75 80

Asp Ala Glu Arg Asp Ile Tyr His Asp Ala Thr His Met Ala Ser Val
 85 90 95

Arg Val Thr Asp Asp Asp Gly Val Glu Val Glu Gly Ile Leu Gly Glu
 100 105 110

Arg Leu Arg Val Lys Pro Leu Pro Ala Met Ala Arg Ser Ser Asp Gly
 115 120 125

Leu Arg Pro His Met Leu Tyr Glu Val Asp Ala His Glu Asn Gly Arg
 130 135 140

Pro His Asp Tyr Gly Ser Pro Asn Thr Thr Asn Thr Pro Val Glu Arg
 145 150 155 160

Arg Ala Gly Gly Thr Glu Pro Gln Met Tyr Lys Ile Pro Ala Glu Ile
 165 170 175

Tyr Pro Glu Val Tyr Leu Val Ala Asp Ser Ala Phe Ala Lys Glu Phe
 180 185 190

Asn Phe Asp Val Asn Ala Val Thr Arg Tyr Phe Ala Val Leu Thr Asn
 195 200 205

Ala Ala Asn Leu Arg Tyr Glu Ser Phe Lys Ser Pro Lys Val Gln Leu
 210 215 220

Arg Ile Val Gly Ile Thr Met Asn Lys Asn Pro Ala Asp Glu Pro Tyr
 225 230 235 240

Ile His Asn Ile Arg Gly Tyr Glu Gln Tyr Arg Asn Ile Leu Phe Lys
 245 250 255

Glu Thr Leu Glu Asp Phe Asn Thr Gln Met Lys Ser Lys His Phe Tyr
 260 265 270

Arg Thr Ala Asp Ile Val Phe Leu Val Thr Ala Lys Asn Met Ser Glu
 275 280 285

Trp Val Gly Ser Thr Leu Gln Ser Trp Thr Gly Gly Tyr Ala Tyr Val
 290 295 300

Gly Thr Ala Cys Ser Glu Trp Lys Val Gly Met Cys Glu Asp Arg Pro
 305 310 315 320

Thr Ser Tyr Tyr Gly Ala Tyr Val Phe Ala His Glu Leu Ala His Asn
 325 330 335

Leu Gly Cys Gln His Asp Gly Asp Gly Ala Asn Ser Trp Val Lys Gly
 340 345 350

His Ile Gly Ser Ala Asp Cys Pro Trp Asp Asp Gly Tyr Leu Met Ser
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agacagtgtc aggacttcag ctgcctagat ggagcctt 158
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<210> 20
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<223> n = A, T, C or G
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attccaantg tctgaccgaa ccgcga 146
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<210> 21
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<212> DNA

<213> Ixodes ricinus

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<221> unsure

<222> (3)

<223> A,C,T or G

<220>

<221> unsure

<222> (10)

<223> A,C,T or G

<220>

<221> unsure

<222> (30)

<223> A,C,T or G

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tttgcttcgg ttttcggtg ggccgaggta tatagtcata agtgtcggtg ggcccatccg 120
aatgagttgt caaatgacat 140

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<211> 143

<212> DNA

<213> Ixodes ricinus

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atatttaagt gcgttcgtga wagctgtggg cttacgattt caggcgcttc antcaccagc 120
tgtgatatta magttcctag 140

<210> 24

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<212> DNA

<213> Ixodes ricinus

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tagcttccat ctttatc a ttga 144

<210> 25
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<212> DNA
<213> Ixodes ricinus

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<210> 26
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ccacattgaa aaaggatcca ag atg gag gca agt ctg agc aac cac atc ctt 172
Met Glu Ala Ser Leu Ser Asn His Ile Leu
1 5 10
aac ttc tcc gtc gac cta tac aag cag ctg aaa ccc tcc ggc aaa gac 220
Asn Phe Ser Val Asp Leu Tyr Lys Gln Leu Lys Pro Ser Gly Lys Asp
15 20 25
acg gca gga aac gtc ttc tgc tca cca ttc agt att gca gct gct ctg 268
Thr Ala Gly Asn Val Phe Cys Ser Pro Phe Ser Ile Ala Ala Leu
30 35 40
tcc atg gcc ctc gca gga gct aga ggc aac act gcc aag caa atc gct 316
Ser Met Ala Leu Ala Gly Ala Arg Gly Asn Thr Ala Lys Gln Ile Ala
45 50 55
gcc atc ctg cac tca aac gac gac aag atc cac gac cac ttc tcc aac 364
Ala Ile Leu His Ser Asn Asp Asp Lys Ile His Asp His Phe Ser Asn
60 65 70
ttc ctt tgc aag ctt ccc agt tac gac cca gat gtg gcc ctg cac atc 412
Phe Leu Cys Lys Leu Pro Ser Tyr Ala Pro Asp Val Ala Leu His Ile
75 80 85 90
gcc aat cgc atg tac tct gag cag acc ttc cat ccg aaa gcg gag tac 460
Ala Asn Arg Met Tyr Ser Glu Gln Thr Phe His Pro Lys Ala Glu Tyr
95 100 105
aca acc ctg ttg caa aag tcc tac gac agc acc atc aag gct gtt gac 508

Thr Thr Leu Leu Gln Lys Ser Tyr Asp Ser Thr Ile Lys Ala Val Asp			
110	115	120	
ttt gca gga aat gcc gac agg gtc cgt ctg gag gtc aat gcc tgg gtt			556
Phe Ala Gly Asn Ala Asp Arg Val Arg Leu Glu Val Asn Ala Trp Val			
125	130	135	
gag gaa gtc acc agg tca aag atc agg gac ctg ctc gca cct gga act			604
Glu Glu Val Thr Arg Ser Lys Ile Arg Asp Leu Leu Ala Pro Gly Thr			
140	145	150	
gtt gat tca tcg aca tca ctt ata tta gtg aat gcc att tac ttc aaa			652
Val Asp Ser Ser Thr Ser Leu Ile Leu Val Asn Ala Ile Tyr Phe Lys			
155	160	165	170
ggt ctg tgg gat tct cag ttc aag cct agt gct acg aag ccg gga gat			700
Gly Leu Trp Asp Ser Gln Phe Lys Pro Ser Ala Thr Lys Pro Gly Asp			
175	180	185	
ttt cac ttg aca cca cag acc tca aag aaa gtg gac atg atg cac cag			748
Phe His Leu Thr Pro Gln Thr Ser Lys Lys Val Asp Met Met His Gln			
190	195	200	
gaa ggg gac ttc aag atg ggt cac tgc agc gac ctc aag gtc act gcg			796
Glu Gly Asp Phe Lys Met Gly His Cys Ser Asp Leu Lys Val Thr Ala			
205	210	215	
ctt gag ata ccc tac aaa ggc aac aag acg tcg atg gtc att ctc ctg			844
Leu Glu Ile Pro Tyr Lys Gly Asn Lys Thr Ser Met Val Ile Leu Leu			
220	225	230	
ccc gaa gat gta gag gga ctc tca gtc ctg gag gaa cac ttg acc gct			892
Pro Glu Asp Val Glu Gly Leu Ser Val Leu Glu Glu His Leu Thr Ala			
235	240	245	250
ccg aaa ctg tcg gct ctg ctc ggc ggc atg tat gcg acg tcc gat gtc			940
Pro Lys Leu Ser Ala Leu Leu Gly Gly Met Tyr Ala Thr Ser Asp Val			
255	260	265	
aac ttg cgc ttg ccg aag ttc aaa cta gag cag tcc ata ggt ttg aag			988
Asn Leu Arg Leu Pro Lys Phe Lys Leu Glu Gln Ser Ile Gly Leu Lys			
270	275	280	
gat gta ctg atg gcg atg gga gtc aag gat ttc ttc acg tcc ctt gca			1036
Asp Val Leu Met Ala Met Gly Val Lys Asp Phe Phe Thr Ser Leu Ala			
285	290	295	
gat ctt tct ggc atc agc gct gcg ggg aat ctg tgc gct tcg gat gtc			1084
Asp Leu Ser Gly Ile Ser Ala Ala Gly Asn Leu Cys Ala Ser Asp Val			
300	305	310	
atc cac aag gct ttt gtg gaa gtt aat gag gag ggc aca gag gct gca			1132
Ile His Lys Ala Phe Val Glu Val Asn Glu Glu Gly Thr Glu Ala Ala			
315	320	325	330
gct gcc act gcc ata ccc att atg ttg atg tgt gcg aga ttt cca cag			1180
Ala Ala Thr Ala Ile Pro Ile Met Leu Met Cys Ala Arg Phe Pro Gln			

335	340	345		
gtg gtg aac ttt ttc gtt gac cgc cca ttc atg ttc ttg atc cac agc 1228				
Val Val Asn Phe Phe Val Asp Arg Pro Phe Met Phe Leu Ile His Ser				
350	355	360		
cat gat cca gat gtt gtt ctc ttc atg gga tcc atc cgt gag ctc 1273				
His Asp Pro Asp Val Val Leu Phe Met Gly Ser Ile Arg Glu Leu				
365	370	375		
taaaaagcat attcttaacg gcggccaatc agtctgtgga gttatctttt agtcactaat 1333				
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<213> Ixodes ricinus				
D <400> 27				
Met Glu Ala Ser Leu Ser Asn His Ile Leu Asn Phe Ser Val Asp Leu				
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D Tyr Lys Gln Leu Lys Pro Ser Gly Lys Asp Thr Ala Gly Asn Val Phe				
	20	25	30	
D Cys Ser Pro Phe Ser Ile Ala Ala Leu Ser Met Ala Leu Ala Gly				
	35	40	45	
D Ala Arg Gly Asn Thr Ala Lys Gln Ile Ala Ala Ile Leu His Ser Asn				
	50	55	60	
D Asp Asp Lys Ile His Asp His Phe Ser Asn Phe Leu Cys Lys Leu Pro				
	65	70	75	80
D Ser Tyr Ala Pro Asp Val Ala Leu His Ile Ala Asn Arg Met Tyr Ser				
	85	90	95	
D Glu Gln Thr Phe His Pro Lys Ala Glu Tyr Thr Thr Leu Leu Gln Lys				
	100	105	110	
D Ser Tyr Asp Ser Thr Ile Lys Ala Val Asp Phe Ala Gly Asn Ala Asp				
	115	120	125	
D Arg Val Arg Leu Glu Val Asn Ala Trp Val Glu Glu Val Thr Arg Ser				
	130	135	140	
D Lys Ile Arg Asp Leu Leu Ala Pro Gly Thr Val Asp Ser Ser Thr Ser				
	145	150	155	160
D Leu Ile Leu Val Asn Ala Ile Tyr Phe Lys Gly Leu Trp Asp Ser Gln				
	165	170	175	
D Phe Lys Pro Ser Ala Thr Lys Pro Gly Asp Phe His Leu Thr Pro Gln				

180

185

190

Thr Ser Lys Lys Val Asp Met Met His Gln Glu Gly Asp Phe Lys Met
195 200 205

Gly His Cys Ser Asp Leu Lys Val Thr Ala Leu Glu Ile Pro Tyr Lys
210 215 220

Gly Asn Lys Thr Ser Met Val Ile Leu Leu Pro Glu Asp Val Glu Gly
225 230 235 240

Leu Ser Val Leu Glu Glu His Leu Thr Ala Pro Lys Leu Ser Ala Leu
245 250 255

Leu Gly Gly Met Tyr Ala Thr Ser Asp Val Asn Leu Arg Leu Pro Lys
260 265 270

Phe Lys Leu Glu Gln Ser Ile Gly Leu Lys Asp Val Leu Met Ala Met
275 280 285

Gly Val Lys Asp Phe Phe Thr Ser Leu Ala Asp Leu Ser Gly Ile Ser
290 295 300

Ala Ala Gly Asn Leu Cys Ala Ser Asp Val Ile His Lys Ala Phe Val
305 310 315 320

Glu Val Asn Glu Glu Gly Thr Glu Ala Ala Ala Ala Thr Ala Ile Pro
325 330 335

Ile Met Leu Met Cys Ala Arg Phe Pro Gln Val Val Asn Phe Phe Val
340 345 350

Asp Arg Pro Phe Met Phe Leu Ile His Ser His Asp Pro Asp Val Val
355 360 365

Leu Phe Met Gly Ser Ile Arg Glu Leu
370 375

<210> 28

<211> 200

<212> DNA

<213> Ixodes ricinus

<400> 28

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aaactcttct tgactttta aaatccaatc tacaatctt cctcgactt ctgaattgca 120
ttccagttta ctttccaagc aaacctcttt tggcaactcc agccgtactc catttcggca 180
taccacagtg catgcacttg 200

<210> 29

<211> 241

<212> DNA

<213> Ixodes ricinus

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cgtattctt gaagatttgt atacgaaaca taaattcgta atgcataactt ttgatggta 60
cacgacatgc gaagctgccg acaaagaaga ctggaaagat aagaagcacc tagttacgg 120
agtgcgtgga ccggataaac gaaagtacac gtttctacgc aacattctca ctttacaacg 180
gagagtgaga gtttagcaaaa caatgattga gctcgtaacgg aacatgtcct gtaggacatt 240
t
241

<210> 30
<211> 313
<212> DNA
<213> Ixodes ricinus

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<223> n = A,T,C or G

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gatgctactc cagttccctcc cgaaagctac acgtacgctg agaatgataa cttcacctgc 120
tattccagaa gtacaccgtt tccggatggg gtgaatgtt tataacggct gctgggtgcg 180
gaagactatg atggattacg caaaaaagtt ctaaacgagt tgtttcccat cccggaaagt 240
ctgctgtatg ctgacatgtat gcgacttgtg gctaagaaag acagagttga tcacactagt 300
ggatgacactg gga
313

<210> 31
<211> 2417
<212> DNA
<213> Ixodes ricinus

<220>
<221> CDS
<222> (218)..(1492)

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tctgcagtcg ttcaccaaca tgtggataca gctccggaga tttgtaaaca aatactgcac 120
ttttaagcaa gacttgatat ttagatcgat atcctcctgt tgccgtctt gattaatcgg 180
ctcttaggg ttttagaat aggctttcg gtacgag atg ccc aaa gga aag agg 235
Met Pro Lys Gly Lys Arg
1 5

gga ccc aaa gca ggt ggc gcc gcg cgc ggt ggc cgg tgc gag gcc agc 283
Gly Pro Lys Ala Gly Ala Ala Arg Gly Gly Arg Cys Glu Ala Ser
10 15 20

ctg gct ccg tcg tcc agc gac gag gag tcc aac gca gac acg gcg agc 331
Leu Ala Pro Ser Ser Asp Glu Glu Ser Asn Ala Asp Thr Ala Ser
25 30 35

gtg ctg agc tgc gcc tcg gag tct cgc tgt ggc agt gac ggc acc gtt 379
Val Leu Ser Cys Ala Ser Glu Ser Arg Cys Gly Ser Asp Gly Thr Val

40	45	50	
gga gac cca gaa gcg gag gag gct gtg ctg cat gac gac ttt gaa gac Gly Asp Pro Glu Ala Glu Glu Ala Val Leu His Asp Asp Phe Glu Asp	55	60	427
55	60	65	70
aaa ctc aag gag gcc atc gac gga gct tcg cag aag agt gcc aaa gga Lys Leu Lys Glu Ala Ile Asp Gly Ala Ser Gln Lys Ser Ala Lys Gly	75	80	475
75	80	85	
cgg ctg tcg tgc ctg gag gcg att cgc aag gcc ttt tcc acc aaa tac Arg Leu Ser Cys Leu Glu Ala Ile Arg Lys Ala Phe Ser Thr Lys Tyr	90	95	523
90	95	100	
ctg tac gac ttc ctc atg gac aga ccg acg gtg tgc gac ctg gtg Leu Tyr Asp Phe Leu Met Asp Arg Pro Ser Thr Val Cys Asp Leu Val	105	110	571
105	110	115	
gag cgt ggg gtg cgc aag ggc cga ggg gag gag gcg gcc ctg tgc gcc Glu Arg Gly Val Arg Lys Gly Arg Gly Glu Glu Ala Ala Leu Cys Ala	120	125	619
120	125	130	
act ctc ggg gcc ctg gcc tgc gtc cag ctc ggg gtc ggg gcc gag gcg Thr Leu Gly Ala Leu Ala Cys Val Gln Leu Gly Val Gly Ala Glu Ala	135	140	667
135	140	145	150
gac gcc ctg ttc gac gcc ctg cgc cag ccg ctc tgc act ttg ctg ctt Asp Ala Leu Phe Asp Ala Leu Arg Gln Pro Leu Cys Thr Leu Leu	155	160	715
155	160	165	
gac ggg gcc cag ggg ccc tcc ccc agg gcc agg tgt gcc act gcc ctc Asp Gly Ala Gln Gly Pro Ser Pro Arg Ala Arg Cys Ala Thr Ala Leu	170	175	763
170	175	180	
ggc ctc tgc tgc ttc gtg gtg gac tcg gac aac cag ctg gtg ctg cag Gly Leu Cys Cys Phe Val Val Asp Ser Asp Asn Gln Leu Val Leu Gln	185	190	811
185	190	195	
ccg tgc atg gag gtg ctc tgg cag gtg ggt gcc aag gcg ggc ccc Pro Cys Met Glu Val Leu Trp Gln Val Val Gly Ala Lys Ala Gly Pro	200	205	859
200	205	210	
ggc tct ccg gtg ctc cag gca gcg gcc ctg ctc gcc tgg ggc ctc ctg Gly Ser Pro Val Leu Gln Ala Ala Leu Leu Ala Trp Gly Leu Leu	215	220	907
215	220	225	230
ctc agc gtg gct ccc gtc gac cgc ctg ctg gcg ctc acg cgc acg cac Leu Ser Val Ala Pro Val Asp Arg Leu Leu Ala Leu Thr Arg Thr His	235	240	955
235	240	245	
ctg ccc cgg ctg cag gag ctg ctg gag agc ccc gac ctg gac ctg cgc Leu Pro Arg Leu Gln Glu Leu Leu Glu Ser Pro Asp Leu Asp Leu Arg	250	255	1003
250	255	260	
att gcg gcc ggg gag gtg atc gcc gtc atg tac gag ggg gcc agg gac Ile Ala Ala Gly Glu Val Ile Ala Val Met Tyr Glu Gly Ala Arg Asp	265	270	1051
265	270	275	

tac gac gag gac ttt gag gag ccc tcg gag tcc ctg tgt gcc cag ctg		1099
Tyr Asp Glu Asp Phe Glu Glu Pro Ser Glu Ser Leu Cys Ala Gln Leu		
280	285	290
cgc cag ctg gcc acg gac agc cag aag ttt cg ^g gcc aag aag gag cg ^g		1147
Arg Gln Leu Ala Thr Asp Ser Gln Lys Phe Arg Ala Lys Lys Glu Arg		
295	300	305
cgc cag cag cgc tcc acc ttc agg gac gtc tac cgg gcc gtc agg gag		1195
Arg Gln Gln Arg Ser Thr Phe Arg Asp Val Tyr Arg Ala Val Arg Glu		
315	320	325
ggg gcc tct ccc gac gtg agc gtc aag ttt ggc cgg gaa gtc ctg gaa		1243
Gly Ala Ser Pro Asp Val Ser Val Lys Phe Gly Arg Glu Val Leu Glu		
330	335	340
ctg gac acc tgg agt cgc aag ctg cag tac gac gct ttc tgc cag ctg		1291
Leu Asp Thr Trp Ser Arg Lys Leu Gln Tyr Asp Ala Phe Cys Gln Leu		
345	350	355
ctg ggc tcc ggc atg aac ctg cac ctg gcc gtg aac gag ctg ctg agg		1339
Leu Gly Ser Gly Met Asn Leu His Leu Ala Val Asn Glu Leu Leu Arg		
360	365	370
gac atc ttt gaa ctg ggg cag gtg ctg gca acc gag gac cac att atc		1387
Asp Ile Phe Glu Leu Gly Gln Val Leu Ala Thr Glu Asp His Ile Ile		
375	380	385
tcc aag atc acc aag ttc gaa agg cac atg gtg aac atg gcc agc tgc		1435
Ser Lys Ile Thr Lys Phe Glu Arg His Met Val Asn Met Ala Ser Cys		
395	400	405
cg ^g gcc cgc acc aag aca cgc aac cg ^g ctg agg gac aag cgc gcc gac		1483
Arg Ala Arg Thr Lys Thr Arg Asn Arg Leu Arg Asp Lys Arg Ala Asp		
410	415	420
gtg gtc gcc tgaacctgcg gagggatgct tagctatgca ctgcggcc		1532
Val Val Ala		
425		
taccctggcg ggactcgatg ccactcacga gtcggcgctc gcaaattcgc cgccccatcgt		1592
tacgcaatgg gagacaaaagc tgctttggc attaccgttt gaggtcggct ccaaccata		1652
gatgaatttc tttttgtgg ccgtttctgg gttacatgtt ttggggaaag ggagtggAAC		1712
tgtccgggttc tttggcacac gtcaggttgc tcttgatgctc cgacgtgctt gtatTTGGGT		1772
actgccgaca ccaaggcgTTT cggcgattcc tgaaaAGAG tgcctctcgc tcgacgtttg		1832
gttgtttct gcgtggtccg tcgtcgacct tcgttcgccc aaagacgccc tccggTTCA		1892
tactcccccc cgcacacata tcgaggccaa ttaaattgct aagggtgccc ttgtcgtgca		1952
tctggcaggc tcagaagtgg cttatttgct tttaatttt gccgatgcac gaaaaattg		2012

tcatttcttg aaagtttctc ttttattgcg tacacaattc aactttatg taatttctga 2072
tggctgttt tacgtgtgcg tgtgtaaaac gtaacttgg aagaattttt atgcacactg 2132
aacaaacgct cggcctggg gttgaaagtg ctcggtgtgt gcatgagcta aagtgcact 2192
gctttgttcc gaaggtttc tagtcgccga aatgtaccat tgtggacctt gttgcgagag 2252
accttggctc tctggggag ctgctgttagc gtggcaagcc actattttgg gagcgacatt 2312
gcagagaaaa tcggctttta gaaaggcacc tgcgccgcga gtggacgttt ttctgtatat 2372
actgcgaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaa 2417

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<211> 425
<212> PRT
<213> Ixodes ricinus

<400> 32

Met Pro Lys Gly Lys Arg Gly Pro Lys Ala Gly Gly Ala Ala Arg Gly
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Gly Arg Cys Glu Ala Ser Leu Ala Pro Ser Ser Ser Asp Glu Glu Ser
20 25 30

Asn Ala Asp Thr Ala Ser Val Leu Ser Cys Ala Ser Glu Ser Arg Cys
35 40 45

Gly Ser Asp Gly Thr Val Gly Asp Pro Glu Ala Glu Glu Ala Val Leu
50 55 60

His Asp Asp Phe Glu Asp Lys Leu Lys Glu Ala Ile Asp Gly Ala Ser
65 70 75 80

Gln Lys Ser Ala Lys Gly Arg Leu Ser Cys Leu Glu Ala Ile Arg Lys
85 90 95

Ala Phe Ser Thr Lys Tyr Leu Tyr Asp Phe Leu Met Asp Arg Pro Ser
100 105 110

Thr Val Cys Asp Leu Val Glu Arg Gly Val Arg Lys Gly Arg Gly Glu
115 120 125

Glu Ala Ala Leu Cys Ala Thr Leu Gly Ala Leu Ala Cys Val Gln Leu
130 135 140

Gly Val Gly Ala Glu Ala Asp Ala Leu Phe Asp Ala Leu Arg Gln Pro
145 150 155 160

Leu Cys Thr Leu Leu Leu Asp Gly Ala Gln Gly Pro Ser Pro Arg Ala
165 170 175

Arg Cys Ala Thr Ala Leu Gly Leu Cys Cys Phe Val Val Asp Ser Asp
180 185 190

Asn Gln Leu Val Leu Gln Pro Cys Met Glu Val Leu Trp Gln Val Val
 195 200 205
 Gly Ala Lys Ala Gly Pro Gly Ser Pro Val Leu Gln Ala Ala Ala Leu
 210 215 220
 Leu Ala Trp Gly Leu Leu Ser Val Ala Pro Val Asp Arg Leu Leu
 225 230 235 240
 Ala Leu Thr Arg Thr His Leu Pro Arg Leu Gln Glu Leu Leu Glu Ser
 245 250 255
 Pro Asp Leu Asp Leu Arg Ile Ala Ala Gly Glu Val Ile Ala Val Met
 260 265 270
 Tyr Glu Gly Ala Arg Asp Tyr Asp Glu Asp Phe Glu Glu Pro Ser Glu
 275 280 285
 Ser Leu Cys Ala Gln Leu Arg Gln Leu Ala Thr Asp Ser Gln Lys Phe
 290 295 300
 Arg Ala Lys Lys Glu Arg Arg Gln Gln Arg Ser Thr Phe Arg Asp Val
 305 310 315 320
 Tyr Arg Ala Val Arg Glu Gly Ala Ser Pro Asp Val Ser Val Lys Phe
 325 330 335
 Gly Arg Glu Val Leu Glu Leu Asp Thr Trp Ser Arg Lys Leu Gln Tyr
 340 345 350
 Asp Ala Phe Cys Gln Leu Leu Gly Ser Gly Met Asn Leu His Leu Ala
 355 360 365
 Val Asn Glu Leu Leu Arg Asp Ile Phe Glu Leu Gly Gln Val Leu Ala
 370 375 380
 Thr Glu Asp His Ile Ile Ser Lys Ile Thr Lys Phe Glu Arg His Met
 385 390 395 400
 Val Asn Met Ala Ser Cys Arg Ala Arg Thr Lys Thr Arg Asn Arg Leu
 405 410 415
 Arg Asp Lys Arg Ala Asp Val Val Ala
 420 425

<210> 33
 <211> 933
 <212> DNA
 <213> Ixodes ricinus

<220>
 <221> CDS
 <222> (32)..(850)

<400> 33

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				Met	Ala	Gly	Leu	Arg	Ser	Cys								
				1				5										
atc	ctc	ctg	gct	ctt	gcc	act	agt	gcc	ttc	gcc	ggc	tac	ctt	cac	ggt		100	
Ile	Leu	Leu	Ala	Leu	Ala	Thr	Ser	Ala	Phe	Ala	Gly	Tyr	Leu	His	Gly			
10				15					20									
ggc	ctt	acc	cac	ggc	gct	ggg	tac	ggt	tac	ggt	gtc	ggc	tac	ggt	tcc		148	
Gly	Leu	Thr	His	Gly	Ala	Gly	Tyr	Gly	Tyr	Gly	Tyr	Gly	Val	Gly	Tyr	Gly	Ser	
25				30					35									
ggc	ctt	ggc	tat	ggc	ctt	ggc	tac	ggt	tcc	ggc	ctt	ggc	tat	gga	cat		196	
Gly	Leu	Gly	Tyr	Gly	Leu	Gly	Tyr	Gly	Ser	Gly	Leu	Gly	Tyr	Gly	His			
40				45					50				55					
gct	gtt	ggc	ctt	gga	cac	ggc	ttt	ggc	tat	tct	ggt	ctg	acc	ggc	tac		244	
Ala	Val	Gly	Leu	Gly	His	Gly	Phe	Gly	Tyr	Ser	Gly	Leu	Thr	Gly	Tyr			
60				65					70									
agt	gtg	gct	gcc	cca	gct	agc	tac	gcc	gtt	gct	gct	cca	gcc	gtc	agc		292	
Ser	Val	Ala	Ala	Pro	Ala	Ser	Tyr	Ala	Val	Ala	Ala	Pro	Ala	Val	Ser			
75				80					85									
cgc	acc	gtt	tcc	act	tac	cac	gct	gct	cca	gct	gtg	gcc	acc	tac	gcc		340	
Arg	Thr	Val	Ser	Thr	Tyr	His	Ala	Ala	Pro	Ala	Val	Ala	Thr	Tyr	Ala			
90				95					100									
gct	gct	cct	gtc	gcc	acc	tat	gct	gtt	gct	cca	gct	gtc	act	agg	gtt		388	
Ala	Ala	Pro	Val	Ala	Thr	Tyr	Ala	Val	Ala	Pro	Ala	Val	Thr	Arg	Val			
105				110					115									
tcc	ccc	gtt	cgc	gcc	cca	gct	gtg	gcc	acg	tac	gcc	gcc	gct	cca			436	
Ser	Pro	Val	Arg	Ala	Ala	Pro	Ala	Val	Ala	Thr	Tyr	Ala	Ala	Pro				
120				125					130				135					
gtc	gcc	acc	tac	gcc	gct	cca	gct	gtg	acc	agg	gtg	tcc	acc	att			484	
Val	Ala	Thr	Tyr	Ala	Ala	Pro	Ala	Val	Thr	Arg	Val	Ser	Thr	Ile				
140				145					150									
cac	gct	gcc	ccg	gct	gtg	gcc	aat	tac	gcc	gtc	gct	cca	gtc	gcc	acc		532	
His	Ala	Ala	Pro	Ala	Val	Ala	Asn	Tyr	Ala	Val	Ala	Pro	Val	Ala	Thr			
155				160					165									
tat	gcc	gct	cca	gct	gtg	acc	agg	gtg	tcc	acc	atc	cac	gcc	gct			580	
Tyr	Ala	Ala	Pro	Ala	Val	Thr	Arg	Val	Ser	Thr	Ile	His	Ala	Ala				
170				175					180									
cca	gcc	gtg	gct	agc	tac	cag	acc	tac	cac	gct	cca	gct	gtc	gcc	act		628	
Pro	Ala	Val	Ala	Ser	Tyr	Gln	Thr	Tyr	His	Ala	Pro	Ala	Val	Ala	Thr			
185				190					195									
gtg	gct	cat	gct	cca	gct	gtg	gcc	agc	tac	cag	acc	tac	cac	gct	gcc		676	
Val	Ala	His	Ala	Pro	Ala	Val	Ala	Ser	Tyr	Gln	Thr	Tyr	His	Ala	Ala			
200				205					210				215					
cca	gcc	gtg	gct	acc	tac	gcc	cat	gcc	gct	ccc	gtc	tac	ggc	tat	ggt		724	

Pro Ala Val Ala Thr Tyr Ala His Ala Ala Pro Val Tyr Gly Tyr Gly				
220	225	230		
gtc ggt acc ctc gga tat ggt gtc ggc cac tac ggc tac gga cac ggt			772	
Val Gly Thr Leu Gly Tyr Gly Val Gly His Tyr Gly Tyr Gly His Gly				
235	240	245		
ctt ggc agc tac ggc ctg aac tac ggt tac ggc ctc ggc acc tac ggt			820	
Leu Gly Ser Tyr Gly Leu Asn Tyr Gly Tyr Gly Leu Gly Thr Tyr Gly				
250	255	260		
gac tac acc acc ctt ctc cgc aag aag taaatggcac atctcaagag			870	
Asp Tyr Thr Thr Leu Leu Arg Lys Lys Lys				
265	270			
agcccatgg actgccatcg acattttct tcaataaaag agcccgaaaga tggcattatt			930	
ttt			933	

<210> 34				
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<212> PRT				
<213> Ixodes ricinus				
<400> 34				
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Phe Ala Gly Tyr Leu His Gly Gly Leu Thr His Gly Ala Gly Tyr Gly				
20	25	30		
Tyr Gly Val Gly Tyr Gly Ser Gly Leu Gly Tyr Gly Leu Gly Tyr Gly				
35	40	45		
Ser Gly Leu Gly Tyr Gly His Ala Val Gly Leu Gly His Gly Phe Gly				
50	55	60		
Tyr Ser Gly Leu Thr Gly Tyr Ser Val Ala Ala Pro Ala Ser Tyr Ala				
65	70	75	80	
Val Ala Ala Pro Ala Val Ser Arg Thr Val Ser Thr Tyr His Ala Ala				
85	90	95		
Pro Ala Val Ala Thr Tyr Ala Ala Ala Pro Val Ala Thr Tyr Ala Val				
100	105	110		
Ala Pro Ala Val Thr Arg Val Ser Pro Val Arg Ala Ala Pro Ala Val				
115	120	125		
Ala Thr Tyr Ala Ala Ala Pro Val Ala Thr Tyr Ala Ala Ala Pro Ala				
130	135	140		
Val Thr Arg Val Ser Thr Ile His Ala Ala Pro Ala Val Ala Asn Tyr				
145	150	155	160	
Ala Val Ala Pro Val Ala Thr Tyr Ala Ala Ala Pro Ala Val Thr Arg				

165 170 175

Val Ser Thr Ile His Ala Ala Pro Ala Val Ala Ser Tyr Gln Thr Tyr
180 185 190

His Ala Pro Ala Val Ala Thr Val Ala His Ala Pro Ala Val Ala Ser
195 200 205

Tyr Gln Thr Tyr His Ala Ala Pro Ala Val Ala Thr Tyr Ala His Ala
210 215 220

Ala Pro Val Tyr Gly Tyr Gly Val Gly Thr Leu Gly Tyr Gly Val Gly
225 230 240

His Tyr Gly Tyr Gly His Gly Leu Gly Ser Tyr Gly Leu Asn Tyr Gly
245 250 255

Tyr Gly Leu Gly Thr Tyr Gly Asp Tyr Thr Thr Leu Leu Arg Lys Lys
260 265 270

Lys